



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,386	03/26/2004	Herbert Hartgrove	03-336	8629
62753	7590	09/30/2009		
VALERIE CALLOWAY CHIEF INTELLECTUAL PROPERTY COUNSEL POLYMER GROUP, INC. 9335 HARRIS CORNERS PARKWAY SUITE 300 CHARLOTTE, NC 28269			EXAMINER STEELE, JENNIFER A	
			ART UNIT	PAPER NUMBER
			1794	
			MAIL DATE	DELIVERY MODE
			09/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/810,386

Applicant(s)

HARTGROVE ET AL.

Examiner

JENNIFER STEELE

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 7/17/2009
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/17/2009 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. **Claim 5-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Mater et al (WO 2003023108 referenced as US 2004/0198125) in view of Kelly (US**

2002/0004348) and Rearick et al (US 6,491,727). Claim 5 describes a structurally-stable hydroentangled flame retardant, nonwoven fabric comprising

- a nonwoven first layer and
- a nonwoven second layer
 - said nonwoven first layer consists of a blend consisting of lyocell fiber and modacrylic fiber
 - wherein said lyocell fiber and said modacrylic fiber in said nonwoven first layer form a char rather than melt when burned,
 - and said nonwoven second layer consists of a blend consisting of lyocell fiber, modacrylic fiber and para-amid fiber,
 - wherein said nonwoven first and second layers are in directly adjacent, hydroentangled united arrangement forming said nonwoven fabric and
 - wherein the lyocell fiber forms a char due to presence of the modacrylic fiber which also chars
 - wherein said lyocell fiber and said modacrylic fiber in said nonwoven second layer form a char rather than melt when burned and
 - the nonwoven fabric remains structurally stable with the paramid fiber and
 - the nonwoven first layer masks discoloration of the nonwoven second layer with para-amid fiber.

Mater teaches nonwoven flame barrier fabrics (ABST). Mater teaches preferred fiber blends are designed to withstand extended periods of time exposed to flame (ABST).

Mater teaches that optionally, natural fibers and regenerated fibers can be included to improve product economics (ABST).

Mater teaches categories of fibers with respect to flame resistance and properties. Mater teaches category 1 fibers that are inherently fire resistant and resistant to shrinkage by a direct flame. Mater teaches category 2 fibers are oxygen depleting fibers and help existing surface flame to self-extinguish.

- Category 1 fibers include melamines, meta-aramids, para-aramids, polyamideimides, flame retardant viscose rayons (e.g. viscose rayon based fiber containing 30% aluminosilicate modified silica) [0023].
- Category 2 fibers are made from polymers with halogenated monomers and include modacrylics [0072].
- Category 3 fibers include low melt binders.
- Category 4 fibers include the natural fibers such as cotton, wool, silk.
- Category 5 fibers include non-flame retardant fibers that are synthetic such as nylons, polyesters, polyolefins, rayons, acrylics, cellulose acetates and polylactides.
- Category 6 fibers are halogenated binder resins [0075-0086].

Mater teaches blends of fibers, preferably to combine category 1 and 2 (para amids and modacrylics) because of synergistic charring effect [0094]. Mater teaches that one layer can be designed to provide emphasis of category 1 fibers and another layer to provide emphasis of category 2 fibers.

Mater teaches percentages of the categories of fibers:

- Category 1: 10-85% more preferably 30-60%,
- Category 2: 10-85%, more preferably 30-60%,
- Category 3: 0-30%, more preferably 10-20%, category 4: 0-40%,
- Category 5: 0-40%, more preferably 10-20%,
- Category 6: 0-40%, more preferably 10-20% [0087-0092].

Mater teaches blending of flame retardant fibers overcome disadvantages of previous fibers for example, hydroentangled nonwoven spunlace flame barriers containing significant amounts of p-aramid fibers impart a yellow color [0014]. Mater teaches a layered quilting panel that has a 1st, 2nd, 3rd, 4th and 5th layer of various blends of flame retardant fibers in the examples [0122-0135]. Further, Applicant is hydroentangling the two layers and ultimately the fabric layers would end up somewhat blended or mixed. Mater's blends encompass the claimed blended layers.

Mater teaches the blends include a paramid fiber and paramid fibers are heat resistant and therefore do not melt or loose structure when exposed to heat and flames. Therefore the paramid fibers of Mater serve to maintain the structure of the fabric as claimed.

Mater differs from the current application and does not teach a lyocell fiber and therefore does not teach the property of a charring lyocell fiber. However Mater teaches the blends produce a synergistic charring effect and therefore it is presumed that the synergistic charring effect would be present with a lyocell fiber as it is with a rayon or cotton fiber.

Mater differs from the current application and does not teach hydroentangling layers together.

Kelly teaches a hydroentangled nonwoven flame-retardant fabric consisting of a blend of melamine and aramid fibers. Kelly teaches a three dimensionally image transfer device for formation of the fabric (ABST). Kelly teaches this provides a fabric with air permeability and thermal protective properties. Kelly specifically teaches that while heat and flame resistant properties of aramid fibers are well known, fabrics produced using aramid fibers are heavy in weight and low in air permeability (col. 2, lines 54-64). Kelly teaches blending the aramid fibers with melamine fibers and use of three dimensional image transfer device to overcome the disadvantages of aramid fibers while still producing a flame retardant fabric.

Rearick teaches methods for reducing the flammability of cellulosic substrates (Title). Rearick teaches that cotton is a preferred cellulosic substrate for textiles and other cellulosic substrates include flax, jute, hemp, ramie, lyocell and regenerated unsubstituted wood celluloses such as rayon (col. 4, lines 61-63). Rearick teaches blends of cotton and other fibers such as modacrylics, rayons and lyocell.

As to claims 5 and 6, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ blends of fire resistant fibers with natural fibers and layers with differing blends as taught by Mater. Rearick presents a finding that one of ordinary skill in the art could have substituted lyocell for the cotton or a rayon fiber of Mater with a reasonable expectation of success. It further would have been

obvious to employ the technique hydroentangling the fibers to produce a flame retardant fabric suitable for use bedding and mattress covers as taught by Kelly.

As to claims 13 and 14, Mater teaches high loft nonwoven layers that have basis weights in the range of 75 to 600 gsm which is equal to 2.2 oz/yd^2 to 17 oz/yd^2 . Mater teaches the varying the basis weights and thickness of the highloft layers to achieve the desired fabric with required flame barrier effect [0114]. Mater teaches the embodiments wherein each of the layers is in the range of 75 to 600 gsm where one layer has a basis weight of 153 gsm and the other layer has a basis weight of 229 gsm. Therefore it would have been obvious to employ two layers, one with a basis weight of 2 oz/yd^2 and the other with a basis weight of 4 oz/yd^2 .

As to claims 15 and 16, Mater teaches a preferred embodiment is a thermally bonded nonwoven highloft flame barrier for use in mattress, upholstered furniture, fiber-filled bed clothing and transportation seating applications is produced by making an intimate staple fiber blend from category 1 and 2 optionally adding fibers from all categories 3,4 and 5 [0022]. Mater teaches the fiber can be staple fiber and staple fiber blends. Further Kelly, teaches carded staple fiber blends of melamine and aramid fibers hydroentangled (col. 2, lines 63-67 and col. 3, lines 1-5). It would have been obvious to employ a staple length fiber motivated to produce a flame retardant nonwoven as taught by Mater and Kelly.

As to claims 17 and 18, Mater teaches the nonwoven fabric layers can have basis weights of 40 gsm through 1800 gsm. Preferably the basis weights from 75 to 600 gsm.

Preferably, 75 gsm is representative of some of the preferred ranges of the present application (page 24).

Response to Arguments

2. Applicant's amendments and arguments filed 7/17/2009 have been fully considered but they are not persuasive. The 35 USC 103(a) rejection over Mater in view of Kelly and Rearick is maintained. Applicants amended the claims to include the limitation that the lyocell fiber forms a char due to presence of the modacrylic fiber and the nonwoven remains structurally stable with the paramid fiber. Applicant's specification teaches the lyocell fiber forms a char due to the presence of the modacrylic fiber. If this is a new property of lyocell found by Applicant, "The discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342,1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977)" MPEP 2112

As Mater teaches a synergistic charring effect in the blends, it is presumed that there would be a synergistic charring effect with the substitution of lyocell for a cotton or rayon of Mater.

3. Applicant argues that the claimed invention is based on the unexpected and surprising finding that lyocell fibers without flame retardant coating from a char in the presence of modacrylic fiber in a fiber blend under burn conditions. The synergistic outcome and result of this particular fiber blend combination is nowhere taught, suggested or predicted in the prior art of record. Applicant states that evidence of this is found in the specification of Sample A that which includes a flame test that the sample fabric tolerated and passed. The evidence in the specification is insufficient to show that the results are unexpected over the combination of Mater, Rearick and Kelly. Specifically, the evidence does not compare the flame test of the current invention to the flame tests of Mater. In other words, the evidence does not show that the substitution of lyocell for the cotton or rayon was used in Mater would produce a result different from the charring effect of Mater. The evidence does not show that BFT Flame test result of 17.1 of the claimed invention is unexpected over the invention of Mater. If Mater's synergistic blends with cotton or rayon do not meet the BFT flame test, this evidence would be sufficient to show that substituting lyocell for cotton or rayon is unexpected. As Applicant has limited the Sample A to one embodiment of the specific composition as claimed in dependent claims 7-12, the evidence must be commensurate with the independent claims 5 and 6.

The specification does not present information on the BFT Flame test and what the result of 17.1 encompasses such that the Examiner can compare this result to the burn test of Mater. Mater tests a composite of a twin mattress according to California Test Bulletin 129.

4. Applicants argue that Mater strongly teaches away from the present invention by requiring "high loft" products where the fibers are blended and processed without hydroentangling. Examiner agrees that Mater is directed to "high loft" nonwovens, however Applicants arguments are not commensurate with the scope of the claims. Applicant's claims do not provide any structural limitations that would distinguish the nonwoven as claimed from a "high loft" nonwoven of Mater. The limitation that the nonwoven is produced by hydroentangling alone does not mean the structure is consolidated versus "high loft" as argued.

While Mater does not teach hydroentangling the layers together, Mater teaches hydroentangling is a known method of producing a nonwoven and therefore it would have been obvious to employ a known technique to produce a nonwoven fabric. Kelly is relied upon as further evidence that it is known in the art to employ the technique of hydroentangling multiple layers together.

5. As to Applicant's prior arguments of record, Applicants submitted NPL that was called an Affidavit, however it is in the form of NPL. The NPL that presents literature on lyocell fibers and how they are made and used as substitutes for cotton and polymer because the lyocell has different properties than cotton and polyester. The 35 USC 103(a) rejection and reference to Rearick shows that lyocell is a fiber known in the art and known in the art to be substituted for cotton and other fibers. The NPL does not present evidence of how the lyocell fiber employed in the current invention has produced an unexpected result that would show one of ordinary skill in the art the substitution of lyocell fibers for cotton or other synthetic fibers would not be obvious. An

Affidavit that is commensurate with the scope of the claims explaining how the lyocell fibers described in the NPL produces a different product, such as claimed, versus a blend of modacrylic and cotton or modacrylic and rayon.

6. Applicant argues that the viscose rayon fibers, Visil.TM, of Mater are not equated with the lyocell as claimed because the Visil.TM fibers have an aluminosilicate FR component. Examiner has removed the statement that the modified flame retardant viscose rayon of Mater is equated with the lyocell claimed and is relying on Rearick to teach that lyocell is a known substitute for cellulosic fibers such as cotton and rayons.

Applicant states that Mater does not disclose a viscose rayon *per se* and instead teaches use of Visil.TM. Mater does teach rayon can be used as a Category 5, synthetic non flame retardant fiber. However, it is understood from the disclosure and the Affidavit that the lyocell of the current Application is not equated with viscose rayon.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER STEELE whose telephone number is (571)272-7115. The examiner can normally be reached on Office Hours Mon-Fri 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S./
Examiner, Art Unit 1794

/Elizabeth M. Cole/
Primary Examiner, Art Unit 1794

9/2/2009